

SHORT COMMUNICATION

Eremophila subangustifolia* (Scrophulariaceae), a rare new species from the Mid West Region of Western Australia, with notes on *E. microtheca

Eremophila microtheca (F.Muell. ex Benth.) F.Muell. was described as a species of *Pholidia* R.Br. by George Bentham in 1870 based on specimens collected at Port Gregory and the Murchison River by Augustus Oldfield, and was later placed in *Eremophila* R.Br. by Ferdinand von Mueller (1882). The species no longer appears to occur in the Port Gregory area (probably due to the clearing of its habitat) but is still known from populations east of Kalbarri. We have examined a photograph of the type of *E. microtheca* and consider the Kalbarri populations to be a good match for this species.

Populations of plants determined to be a southern form of *E. microtheca* were subsequently found some 250 km to the south of Kalbarri near Eneabba. These plants differ in morphology from the type and were alluded to by Chinnock (2007) when he stated ‘The Kalbarri population differs from more southern ones in having flattened leaves’.

In order to further ascertain the relationships of the two forms, a molecular study was conducted in 2013 using nine microsatellite markers. This study showed plants in the Eneabba populations to be genetically divergent from those found east of Kalbarri (Llorens *et al.* 2015). Plants in these two areas shared few alleles with one another and showed very high and significant values for measures of genetic differentiation ($F_{ST} = 0.301$ and 0.383 ; $D_{est} = 0.756$ and 0.774 ; $P < 0.001$). Several other statistical methods, including Bayesian STRUCTURE analysis, analysis of molecular variance (AMOVA), neighbour joining and principal coordinate analysis (PCoA), supported these results in showing a clear and significant divergence among plants from the two areas. Notably, the levels of differentiation among the Eneabba and Kalbarri populations were very similar to those obtained for interspecific comparisons between populations of *E. microtheca* and *E. lehmanniana* (Sonder) Chinnock, a closely allied species according to Chinnock (2007).

In recognising its distinctiveness, the Eneabba taxon was provided the phrase name *E. microtheca* subsp. narrow leaves (J.D.Start D12-150) by the Western Australian Herbarium in 2013 and, because of its narrow distribution, highly threatened habitat (flooding and rising salinity) and low number of extant plants, was subsequently listed as Threatened Flora under the provisions of the Western Australian *Wildlife Conservation Act* 1950.

Additional field and herbarium studies were undertaken by one of us (Andrew Brown) between 2013 and 2017, during which a number of additional morphological differences separating these taxa were noted. Consequently, we are now of the opinion the Eneabba taxon warrants recognition as a species rather than a subspecies and in March 2017 the Western Australian Herbarium erected the new phrase name *E. sp. Narrow leaves* (J.D. Start D12-150) to reflect this view.

Eremophila subangustifolia A.P.Br. & Llorens, *sp. nov.*

Type: [near Eneabba] Western Australia [precise locality withheld for conservation reasons], 17 September 2013, *J.D. Start* D12-150 (*holo*: PERTH 08490910).

Eremophila microtheca subsp. narrow leaves (J.D.Start D12-150) \equiv *Eremophila* sp. Narrow leaves (J.D. Start D12-150), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed March 2017].

Illustrations. A.P. Brown & B.J. Buirchell, *A Field Guide to the Eremophilas of W. Austral.*, p. 185 (2011), top left and bottom right [as *E. microtheca*].

An erect to spreading, much-branched shrub, 1–2.5 m high, 2–4 m wide when mature, emitting a strong, slightly offensive odour. *Branches* grey, terete, non-tuberculate, young parts with dense, grey-white dendritic hairs, except for glabrous resinous bands extending down below leaf bases, old parts lacking hairs. *Leaves* green to grey-green, sessile, alternate, erect or spreading, scattered along branches; lamina linear-subterete, 6–17 mm long, 0.5–1 mm wide, the upper and lower surfaces with scattered, grey-white dendritic hairs; apex obtuse to subobtuse. *Flowers* 1 per axil; pedicel terete, straight or slightly curved, 5–7 mm long, with dense, grey-white dendritic hairs. *Sepals* 5, lanceolate, attenuate, imbricate, subequal, appressed against the corolla, 4–6 mm long, 0.8–1 mm wide, not enlarging after flowering; outer surface green with dense, grey-white dendritic hairs; inner surface green with dense grey-white dendritic hairs in the distal third, more sparsely hairy below except along margins. *Corolla* zygomorphic, 12–15 mm long, 8–12 mm wide; outer surface glabrous, pale lilac, unspotted; inner surface white, pale mauve to fawn-spotted near centre, glabrous except for scattered villous-arachnoid hairs extending down from below the medial lobe of lower lip; lobes pale lilac, unspotted, subequal, spreading, obtuse. *Stamens* 4, included; filaments glabrous; anthers glabrous. *Ovary* ovoid, 4-locular with 1 ovule per locule, 2–3 mm long, 1.2–1.5 mm wide, glabrous; style 10–12 mm long, glabrous. *Fruit* dry, ovoid-conical, 3–4 mm long, 2–2.5 mm wide, rugose, glabrous. Seed unknown. (Figure 1)

Diagnostic features. *Eremophila subangustifolia* is distinguishable from other members of *E.* sect. *Australophilae* Chinnock by the following combination of characters: erect to spreading, much-branched shrub 1–2.5 m high, 2–4 m wide; branches, leaves and sepals with dense, grey-white dendritic hairs; leaves linear-subterete, 6–17 mm long, 0.5–1 mm wide; flowers 1 per axil; pedicel terete, 5–7 mm long; corolla pale lilac; outer corolla, ovary and fruit glabrous.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 23 Feb. 1997, *J.A. Cochrane* JAC 2289 (PERTH); 27 Aug. 1948, *C.A. Gardner* 9109 (PERTH, 4 sheets); 20 Aug. 1982, *S.D. Hopper* 2478 (PERTH); 6 Jan. 1992, *S.J. Patrick* SP 931 (PERTH); 6 Jan. 1992, *S.J. Patrick* SP 932 (PERTH); 20 Jan. 2014, *B. & P. Phillips s.n.* (PERTH); 2 Sep. 1993, *L. Sweedman* 3350 (PERTH).

Distribution and habitat. Found near Eneabba in the Geraldton Sandplains bioregion (*sensu* Department of the Environment 2013), growing on slightly saline, pale brown sandy clay on the margins of seasonally wet flats and lakes. Associated species include *Acacia saligna*, *Casuarina obesa* and *Melaleuca raphiophylla*.

Phenology. Predominantly flowers from June to October.



Figure 1. *Eremophila subangustifolia*. A – plant showing the spreading habit of the species when mature; B – branch showing the characteristic linear-subterete leaves, long flower pedicel and pale lilac flowers; C – corolla showing the white, pale mauve to fawn-spotted inner tube and scattered villous-arachnoid hairs. Photographs by A. Brown.

Conservation status. *Eremophila subangustifolia* is listed as Threatened Flora in Western Australia (Smith & Jones 2018), under the phrase name *E. sp. Narrow leaves* (J.D. Start D12-150) and is ranked as Critically Endangered. The species is confined to a single location near Eneabba where it comprises two narrowly separated populations (these may have been one continuous population prior to clearing). Flooding in 1999 caused a substantial decline in Population 1 and just 66 plants were located in November 2013. Population 2 has declined from *c.* 10,000 mature plants in 1992 to just 16 plants in January 2014.

Etymology. From the Latin *sub-* (somewhat), *angustus* (narrow) and *-folius* (-leaved), in reference to the narrower leaves of this species compared to those of the related *E. microtheca*.

Affinities. *Eremophila subangustifolia* belongs to *E. sect. Australophilae*, which comprises 33 species, 30 of which are endemic to Western Australia. Within this section, *E. subangustifolia* appears closest in morphology to *E. microtheca* and is similarly characterised by its finely dendritic-pubescent branches, leaves and sepals, strongly aromatic leaves, and small, pale lilac flowers. It differs, however, in its (when mature) larger, more spreading habit 1–2.5 m high \times 2–4 m wide (0.8–1.5 m high \times 0.3–1 m wide in *E. microtheca*), its longer, narrower leaves 6–17 mm long \times 0.5–1 mm wide (3–7 mm long \times 1.5–2 mm wide in *E. microtheca*), its longer flower pedicel 5–7 mm long (1–2 mm long in *E. microtheca*) and its larger flowers 12–15 mm long \times 8–12 mm wide (10–12 mm long \times 5–8 mm wide in *E. microtheca*).

Eremophila subangustifolia does not grow with or near other species in *E.* sect. *Australophilae*. The only other *Eremophila* species to occur near *E. subangustifolia* is the unrelated *E. glabra* (R.Br.) Ostenf.

Acknowledgements

We thank Rob Davis who accompanied one of us (Andrew Brown) when conducting field studies comparing this new species with its close relative *E. microtheca* and who made valuable comments during discussions about these two taxa. We also thank Anthea Jones for assessing the conservation status of this species, staff at the Western Australian Herbarium for their assistance, and staff at the Royal Botanic Gardens Victoria who kindly provided us with a scan of the type of *E. microtheca*.

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